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L8	L7 and (tasks or actions)	58	L8
L7	L6 and (process$ near loan or process$ with loan or process$ adj loan)	65	L7
L6	L5 and portal	125	L6
L5	(mortgage with loan or mortgage near loan or mortage adj loan)	1659	L5
L4	705.clas.	43365	L4
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L2	L1 and "computer useable medium"	2169	L2
L1	"computer program product"	78049	L1

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REPRESENTATIVE-FIGURES: 1

ABSTRACT:

In an operating system (OS) for a multimedia communications center (MMCC), an interactive process module (IPM) for accomplishing a process has a plurality of code sets, each adapted to completion of a specific task in the overall process, an input interface for providing one or more inputs to the IPM, and an output function for returning a result. The plurality of code sets are related by pre-requisite status, creating a required order of progression for the process, the process is initiated after being called by the OS and receiving required inputs, the IPM is adapted to interface with other OS modules for accessing and providing data, and upon completion of the last task the IPM returns the result. In one embodiment the

IPM is represented by an interactive GANT chart. In a preferred embodiment a tool kit is provided for a programmer to create such IPMs to perform business processes. IPMs thus created may be displayed and edited as object models.

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Abstract Paragraph:
In an operating system (OS) for a multimedia communications center (MMCC), an interactive process module (IPM) for accomplishing a process has a plurality of code sets, each adapted to completion of a specific task in the overall process, an input interface for providing one or more inputs to the IPM, and an output function for returning a result. The plurality of code sets are related by pre-requisite status, creating a required order of progression for the process, the process is initiated after being called by the OS and receiving required inputs, the IPM is adapted to interface with other OS modules for accessing and providing data, and upon completion of the last task the IPM returns the result. In one embodiment the IPM is represented by an interactive GANT chart. In a preferred embodiment a tool kit is provided for a programmer to create such IPMs to perform business processes. IPMs thus created may be displayed and edited as object models.

Summary of Invention Paragraph:
[0011] Recent improvements to available technologies associated with the transmission and reception of data packets during real-time DNT communication have enabled companies to successfully add DNT, principally IPNT, capabilities to existing CTI call centers. Such improvements, as described herein and known to the inventor, include methods for guaranteeing available bandwidth or quality of service (QoS) for a transaction, improved mechanisms for organizing, coding, compressing, and carrying data more efficiently using less bandwidth, and methods and apparatus for intelligently replacing lost data via using voice supplementation methods and enhanced buffering capabilities.

Summary of Invention Paragraph:
[0015] Due in part to added costs associated with additional equipment, lines, and data ports that are needed to add IPNT capability to a CTI-enhanced call-center, companies are currently experimenting with various forms of integration between the older COST system and the newer IPNT system. For example, by enhancing data servers, interactive voice response units (IVR's), agent-connecting networks, and so on, with the capability of conforming to Internet protocol, call data arriving from either network may be integrated requiring less equipment and lines to facilitate processing, storage, and transfer of data.

Summary of Invention Paragraph:
[0019] Business procedures, as described above, include and encompass any ordered processes that may be required before a conclusion may be reached regarding an issue or request. An example of a standard business procedure may be a process for qualifying a client for a loan. A business procedure as such may be broken down into ordered steps and sub-steps. For example, an automated business application designed to qualify or not a requesting client may begin with the step of client identification and data acquisition. Sub-steps involved in client data acquisition may include 1) obtaining last credit report, 2) obtaining past credit history with the enterprise, 3) obtaining current income and asset information, and so on.

Summary of Invention Paragraph:
[0020] An issue with which to contend regarding current art communication centers is the fact that human intervention is required when performing more complicated business processes such as the one described above. For example, an operator or agent may be required to manually type in access to certain databases via keyboard. Obtained information must be processed, in many instances, via manual calculation such as calculating income to debt ratio (in the case of a loan process) and so on. Because of such human involvement in one or more stages in a typical process, the propensity for error is high. Also, such interference consumes time both valuable to the enterprise and to the client. Beyond that, if someone "drops the ball", the transaction may not be closed in time, and it maybe difficult if not impossible to find in time at which manual step the issue was dropped.

Summary of Invention Paragraph:
[0022] In a preferred embodiment of the present invention, in an operating system (OS) for a multimedia communications center (MMCC), an interactive process module (IPM) for accomplishing a process is provided, comprising a plurality of code sets, each adapted to completion of a specific task in the overall process; an input interface for providing one or more inputs to the IPM; and an output function for returning a result. The plurality of code sets are related by pre-requisite status, creating a required order of progression for the process, the process is initiated after being called by the OS and receiving required inputs, the IPM is adapted to interface with other OS modules for accessing and providing data, and upon completion of the last task the IPM returns the result.

Summary of Invention Paragraph:
[0023] In a preferred embodiment task structure and parameters are presentable in a graphical interface displaying tasks making up the IPM in prerequisite order. The graphical interface may be a GANT chart. Preferably the graphical interface is interactive, allowing a programmer to add, delete, and edit steps in the process.

Summary of Invention Paragraph:
[0024] In some cases start and finish times are displayed for each task. Also in some cases, in performing any one task, next activity is variable, and is determined by performance to requirements programmed with the task. Task requirements may include completion within a preprogrammed allotted time. Next activity may include a choice of stopping the process and notifying a person in the event of non-completion of a task in an allotted time.

Summary of Invention Paragraph:
[0025] In some cases one or more tasks require human intervention and activity, and there may be a selective activity of reminding a person responsible for an activity of a pending time deadline.

Detail Description Paragraph:
[0048] Computer telephony integration (CTI) enhancement is, in this embodiment, provided both at communication center 17 and in PSTN 13. For example, in PSTN 13, a processor 61 running instances of a CTI application known as a T-server (TS) to the inventors, and a statistics server (Stat) is connected to telephony switch 19 via CTI link 65. An intelligent peripheral 59 of the form of an interactive voice response unit (IVR) is connected to processor 61 via data connection 63. Similar CTI equipment is illustrated within communication center 17. Namely, a processor 67 running instances of TS and Stat and connected to telephony switch 27 via CTI link 71, and an IVR 69 connected to processor 67 via a data connection 73, with processor 67 further connected to a local area network (LAN) 55 within communication center 17.

Detail Description Paragraph:
[0051] In a preferred embodiment of the present invention, a customer-interaction network operating system, hereinafter termed (CINOS), is provided for the purpose

of managing communications center 17, and optimizing and recording all agent/customer interactions received at communication center 17 from networks 13 and 15. CINOS is unique in the fact that it is a multi-tiered object-and process-orientated system wherein logic regarding the various aspects of it's functionality is achieved via knowledge-based architecture and object modeling. Various functions of CINOS, more fully described below, include capturing (recording), analyzing, routing, and, in many instances, responding via automated process to customers engaged in interactions with the enterprise (company hosting the communication center). CINOS is adapted to support all planned communication mediums such as multimedia DNT applications including e-mail, video mail, file transfers, chat sessions, IP calls, and CTI COST transactions such as voice calls, voice mails, faxes, and so on.

Detail Description Paragraph:
[0056] Once a call or other communication event registers at either switch 27 or routing server 29, CINOS immediately identifies the media type associated with the call and begins it's processes depending on enterprise rules. For example, a live COST call may first be routed to IVR 69 whereby the customer can be presented with varying choices such as leaving a voice message, waiting in queue, receiving a call back, or perhaps an e-mail, and so on. Interaction by IVR 69, in this instance, will preferably be via voice recognition technique such as is known in the art, but may also be via touch tone response or other known method. As previously described, the caller may elect from a number of options, such as to hold for a next available agent, select an automated response such as a fax back, or perhaps a later agent-initiated response such as an e-mail or call back. In all cases, CINOS seamlessly processes and executes the logic required to accomplish the goal of the caller in a media and application-independent fashion.

Detail Description Paragraph:
[0058] All interactions with live external media, including actual text-based events whether live or not, are recorded and stored in MIS 79 with an associated text version of the media stored as well, and becoming part of an overall threaded contact history. This is accomplished in varying ways according to existing parameters such as media type, whether the event is a live call, and so on. For example, CINOS may execute a command directing IVR 69 to digitally record an incoming COST call during customer interaction and then store the voice recording of the transaction in MIS 79. A text version of the recording either created simultaneously from the voice recording via voice-to-text techniques (known in the art), or created by a live attendant via manual annotation may be sent to and stored in DB 79. An IPNT call arriving at routing server 29 may be similarly recorded and stored in MIS 79 with an associated text version of the interaction stored in DB 79. E-mails, video calls, voice mails and so on are similarly handled. For example, an incoming e-mail is stored in MIS server 79 while text from the e-mail may be extracted and stored associated with the e-mail.

Detail Description Paragraph:
[0062] Parsing text messages is accomplished via a text-analyzer known to the inventor. In other non-text media types, such as video or graphics, descriptive notes may be taken via live attendant and stored in DB 79 as previously mentioned. Voice recognition technology may also be used in a case of recorded sound or video with sound. All transactions regardless of media type are thus recorded and stored according to enterprise rules with at least a meaningful part of the content if not all of the content of such transactions converted to text and stored in DB 79 associated with the recording of the event. Again, the importance of the text version is that the extracted knowledge of the transaction therein is in machine-operable code, allowing search and cross-referencing functions that may otherwise not be possible.

Detail Description Paragraph:
[0063] After incoming events are analyzed and processed with regards to queuing,

recording, storing, etc. CINOS decides the disposition paths of each event. For example, live calls in queue are routed to live agents if available, if this is the priority action in the enterprise rules. E-mails are either routed to next available agents using a push technology, or simply stored in MIS server 79 where they may be retrieved by agents after receiving notification. Recorded events such as IVR voice requests are stored in MIS server 79 where they may be retrieved by agents, and so on.

Detail Description Paragraph:
[0076] Workflow layer 85 comprises 3 basic function categories beginning with a content analysis category 89 wherein textual analysis, voice analysis, IVR interaction, recording and storing takes place. A next category is context resolution 91. Context resolution involves customer identification, business process binding, preparation for routing, and so on. A third category termed interaction routing 93 comprises various processes associated with the presentation of the interaction to agents, service persons, knowledge workers, business partners, customers and the like, that is, all transaction partners. Category 93 covers queuing, skill-based routing, automated treatment, workflow models, and so on.

Detail Description Paragraph:
[0086] In step 111, a maximal text version is prepared from the actual transaction. The ability to do so depends to a degree on the sophistication of the system. This process may be as simple as a person adding notes for annotation or as sophisticated as a voice-to-text application preparing a full text version as the transaction transpires.

Detail Description Paragraph:
[0093] A business-logic layer comprises business object models 129, hereinafter termed business objects 129, representing contacts, interactions, knowledge-bases, events, routing processes, and other system routines. Integration and interaction of the various described desktop components with these logics is accomplished via common object modeling (COM) which is known in the art and available to the inventor. Desktop to CTI integration is accomplished via controls provided or created with a CTI set of tools or tool kit (not shown). For example, if the enterprise desires to blend voice and e-mail, the CTI tool kit would be used to build and integrate the interface.

Detail Description Paragraph:
[0097] An enterprise-controlled access point may be defined as an interfacing window or portal created and maintained at a typical customer entry point in a network as may be known in the art. Such interfaces may take the form of a WEB-based customer interface (a WEB page), an interactive voice response (IVR) unit, a service control point (SCP), or some other customer-facing system or apparatus as may be known in the art.

Detail Description Paragraph:
[0105] To further illustrate, refer now to new client section 135. If window 133 is part of the enterprise WEB page, as is the case with this example, there will be a variety of visitors which may or may not be pre-qualified by the enterprise. Therefore, an interested party would begin (and be restricted to) taking a new client survey, illustrated as one of the options in section 135. If the enterprise rules require this as a first step, then the other options may be enabled only upon completion of the survey. By choosing new client survey, a second window may contain various survey options such as via e-mail, interactive voice recording, type and send method, or the like.

Detail Description Paragraph:
[0108] Section 137 presents media options for clients seeking customer service from the enterprise. These options are, in a preferred embodiment, presented in a

customized or personalized fashion within the client's window 133 as was described above. Therefore, each client patronizing the enterprise may access a version of window 133 that differs in look and functionality than that of another client. In this example, service section 137 contains options for e-mail, chat program, fax program, a self-help wizard, and a voice wizard. Other media types may be added or subtracted from the client's window 133 depending on any of several criteria. Personalization of widow 133 takes into account client information as stored in CINOS database 75, service-agent media availability and preferences, and perhaps any overriding enterprise rules. Unless and until a client is identified there are typically no options presented to the client for continuing a transaction with the enterprise.

Detail Description Paragraph:
[0110] Self-help wizards and voice wizards as illustrated in section 137 may be offered to help a client resolve an issue without taxing further resource. Such wizards may be customized based on a client's recorded data, perhaps confirming past interactions, providing account or order status, and so on. In some embodiments, selecting an option might avail several additional options. For example, selecting chat program may avail three possible chat programs to choose from with different schedules, content, and functionality attributed to each individual program.

Detail Description Paragraph:
[0115] As an integral part of CINOS functionality, window 133 acts as a portal through which existing and potential clients may be screened, categorized and routed according to enterprise rules. Customer interfaces such as window 133 may be provided at various locations on a WAN such as the Internet without departing from the spirit and scope of the present invention. Such portals may exist in different geographic regions, and may be created for differing customer bases such as one for Latin America, and one for the pacific rim, and so on. Instances of CINOS routine may be distributed widely over a network.

Detail Description Paragraph:
[0117] CINOS, as previously described, optimizes customer/agent interaction in a manner which is economical and cost efficient to both the enterprise and the patronizing client. The customer interfacing window as taught herein with regards to FIG. 5 is innovative in that it is a filly customizable portal that facilities seamless integration between clients and enterprise agents according to enterprise rules. Further innovation is evident in that client data is fully and seamlessly integrated with CINOS intelligence and enterprise rules regarding routing of interactions and other constraints or limitations that are programmed into the system. In effect, logic from the front end, or customer side, to the back end or agent side is linked and accessible to all appropriate CINOS routines which include applicable CTI CINOS routines. The various customer interfacing logic is are explained more fully below in a series of process logic steps in a flow chart.

Detail Description Paragraph:
[0119] If the visitor wishes to be a client, he may log-in to the network system in step 159. Log-in may be automatic in the event that CINOS remembers the client's assigned password, or perhaps typing the password or other code may still be required for security reasons. At the time of log-in, window 133 is presented in personalized fashion according to client data and enterprise rules in step 161. In step 163, interaction between an enterprise entity and the client begins with a media type that is offered by the enterprise and selected by the client. An enterprise entity, as immediately described above, is herein defined as an agent, knowledge worker, service person, or any other live attendant, as well as any entity constituting an automated response action such as an automated fax, an IVR, automated file downloads, etc.

Detail Description Paragraph:

[0134] Creating text-based versions of live multimedia interactions may, in some cases, be accomplished via an automated method. For example, a digital voice attendant 197 is provided and linked to IPNT switch 176. Digital voice attendant 197 may be of the form of a DNT-capable IVR or other digital voice-response mechanism as may be known in the art. Such automated attendants may interact with a voice caller instead of requiring a live agent. A speech to text converter 199 is provided and linked to voice attendant 197. As digital voice attendant 197 interacts with a caller, speech to text converter 199 uses voice recognition technology to convert the audio speech to text. Such text may then be stored automatically into text section 191 and related to the also-recorded audio data.

Detail Description Paragraph:
[0139] An intelligent peripheral in the form of a COST IVR 177 is provided for the purpose of interacting with callers seeking information and the like who do not require connection to a live agent. IVR technology may comprise voice response, touch tone interaction, or a combination of these technologies. IVR 177 is linked to processor 179 and also to automated services 193. An example of an IVR interaction may be the presentation to a caller of options for using an automated service such as those described above, or perhaps waiting for a live agent.

Detail Description Paragraph:
[0164] According to various embodiments of the present invention, which are described below, the multimedia applications may be adapted for such tasks as placing orders, previewing products, determining customer profitability, calculating sales volumes, reviewing agent performances, or any other enterprise-conceived objective. The abilities and constraints applied to these unique applications are limited only by the imagination, and tools available to an authorized programmer or worker, such as a knowledge worker, who creates the applications.

Detail Description Paragraph:
[0166] Among these functional modules are interactive media viewers (IMV's) 227 which are provided and adapted for viewing certain media supported by the enterprise hosting a communication center employing CINOS. Supported media types may include but are not limited to telephony (traditional or IP), interactive voice response (IVR), e-mails, WEB embedded interfaces or forms, faxes, chat programs, multiparty threaded discussions, etc. IMV's 227 are unique in the fact that they are dedicated viewers including an interactive layer that enables viewing of only pre-selected media as defined by enterprise rules. For example, CINOS users may be assigned an identification code or number which will also be tagged to all of their stored interactions as described elsewhere above with reference to FIG. 9. These codes may be used to associate individuals with limitations and constraints from viewing media that is not part of their own contact history (for example). Other limitations or constraints may also be applied to IMV's 227 as may be conceived and implemented by a programmer such as playing or viewing interactions of certain dates, playing or viewing interactions about certain subjects, and so on. An editable software layer inherent to each viewer enables a programmer to build such constraints into a particular viewer, and to add the edited viewer to an IMA.

Detail Description Paragraph:
[0179] Although not explicitly shown, each IMV is editable through a software layer. In this way, a user may be limited to viewing certain media interactions and transactions that are allowed via enterprise rules. For example, TXT viewer may only be able to view e-mails from the user and agent in a specific interaction thread, but not intermittent e-mails on the thread that may be from agent to agent or supervisor to agent and so on. Because each interactor with CINOS has an identification, and all interactions from or to them are so identified, these identifiers may be used in the edit layer of each viewer to constrain the user. In this way, a user may be granted access to a history database and view only his interactions without imposing on other users who share the system. Likewise, agents

or supervisors charged with the task of reviewing the activities of certain other agents may use applications such as IMA 239, adapted for the stated purpose, and be constrained in terms of whose interactions (agent's) may be viewed, and so on. In this manner full use may be provided to specialized users without exposing otherwise sensitive information that is not pertinent to the user or the purpose of the IMA.

Detail Description Paragraph:
[0190] It will be apparent to one with skill in the art that IMA 239 as taught herein is interactive and displayable on a PC/VDU that is logged into CINOS through a WAN. However, this is not specifically required to practice the present invention, but rather preferred. Other embodiments may include presenting a CTI interface such as an IVR wherein a user may interact with the application via voice or touch tone response.

Detail Description Paragraph:
[0197] Automated CINOS systems such as systems 255 through 261 are adapted to interact with data stored in repository 263 in order to perform their intended functions related to CINOS operation. For example, CIS 255 uses data in repository 263 for presenting information to agent's at the time of or ahead of a live interaction. AT SYS 257 has to access and process data for generating system audits. RT SYS 259 requires data for intelligent routing purposes. AS SYS 261 uses data to update and configure services such as faxes, e-mails, voice messaging, and the like.

Detail Description Paragraph:
[0214] As briefly described in the background section above, in a multimedia communication center it is desired to automate business processes where possible and to be able to break down the processes into tasks and sub-tasks that are strictly controlled and timed. Prior art network systems require considerable human intervention while proceeding with a business process while, for example, a client waits for a resolution. Similarly, more time is consumed because actual media and hard data may be accessed and processed without the benefit of an abstract representation of data (metadata) as discussed above relative to an interaction object model (IOM). Therefore, an Interactive Process Model (IPM), is provided as a generic programmable module, which when complete, represents and conducts a defined business process. An IPM according to this invention has ability to obtain data from an IOM and to manage business applications in terms of timing and execution of main tasks and sub-tasks that are programmed according to enterprise rules.

Detail Description Paragraph:
[0215] FIG. 14 is a Gant table illustrating a pre-defined business process according to an embodiment of the present invention. A Gant table 287 represents the tasks and sub-tasks of a business procedure, in this case qualifying an exemplary loan application, as they might appear on a programmers screen after an automated execution sequence has been completed. Gant table 287 will hereinafter be termed Interaction Process Model (IPM) 287 for the purpose of simplifying explanation.

Detail Description Paragraph:
[0216] IPM 287 is a programmable interactive engine as previously described. That is, one may program IPM 287 according to various tasks and sub-tasks that may be required for the execution of a particular business process. After basic programming or set-up, IPM 287 has the capability of accessing data from, among other possible sources, the IOM described above, and using that data in the execution of it's intended goal. IPM 287 is innovative in the fact that it begins as a generic object model (for example a COM container) in which a programmer may add specific functionality (COM objects) to create a functional interface engine or model that may execute a timed business procedure according to enterprise rules.

Detail Description Paragraph:
[0217] Although IPM 287 is, in this case, a loan application process, such an IPM may be programmed to execute virtually any conceivable business process that an enterprise may offer as a wholly or partially automated service to clients. IPM 287, in this example, is presented as a series of rows and columns comprising entry fields and return fields in a GANT chart. For example, before the desired functionality is inserted into IPM 287, it is a generic COM model that is adaptable via programming for various business processes and resource interface as previously described. It will be apparent to those with skill in the art that a COM model and a GANT form are each simply exemplary of known devices that may be employed in practicing the invention The format of entry and return fields presented herein is not required to practice the present invention. The inventor merely deems this particular format to be friendly to a programmer building the model and analyzing the returns such as may be displayed on a computer screen. A tool kit aids a programmer with building and fine tuning an IPM such as IPM 287. Such a tool kit may be part of the programmers desk-top CINOS application such as perhaps tool kit 125 of FIG. 4, or may reside in and be accessible from a server hosting a CINOS Manager application such as server 77 of FIG. 1.

Detail Description Paragraph:
[0218] FIG. 14 is a GANT chart for a process executable by a CINOS operating system according to an embodiment of the present invention. This chart in this embodiment is an interactive input and display and editing interface wherein a programmer may program a business process having discrete steps and sub-steps. It will be apparent to the skilled artisan that such an interface is but one of a number of interfaces that would be suitable for the purposes of the invention, and is meant to illustrate features of the invention. Broadly speaking, by listing steps of a process in this chart along with parameters to be described more fully below, an application module is created which, by execution, performs the process step by step, and tracks completion of individual tasks, as well as providing reminders when and if allotted completion times are pending or exceeded, and so forth. It will be apparent to the skilled artisan that GANT processes may also be illustrated by flow diagrams (typically PERT charts), and, in a preferred embodiment, the chart depicted in FIG. 14 may be converted to an editable GANT flow chart as well. For Example, standard products like MSProject Planner may be used to generate a PERT or GANT chart, and by using certain labels both for steps and resources, the generated file may directly become an IPM Object.

Detail Description Paragraph:
[0219] Referring again to FIG. 14, a title row 289 comprises column headers and a link to a pop-up editing window that provides for entering steps and necessary parameters. The pop-up window in a preferred embodiment has input fields for entering task numbers, specific action for the task, sequence and pre-requisites related to other tasks, allotted time to complete, and notification parameters, as well as a Cancel and a Save function. Through the input window a programmer can design and relate all tasks and sub-steps needed for a process.

Detail Description Paragraph:
[0220] Because IPM 287 is a container for COM objects, task objects may also be loaded as required by the programmer in order to set up the main and sub-tasks inherent to the process as previously described such as by drag and drop method as is known in the art. For example, certain objects or modules to be inserted are for access to certain data from the IOM, while other objects are adapted for accessing certain other databases or resources, or for performing certain process-related functions.

Detail Description Paragraph:
[0223] A completed chart is editable in the sense that steps and sub-steps may be altered, added, deleted, and the like, along with names, allotted times, action parameters, and the like. A programmer may therefore select an existing application

module and edit it to save as a new application module.

Detail Description Paragraph:
[0224] When a module is complete the application created may be stored and related to other tasks such that the application may be called whenever necessary to perform functions for the operating system. Such processing will typically be transparent to agents, clients, knowledge workers and the like, but on certain occasions, by need, a chart may be displayed while a process is running or for other diagnostic purpose.

Detail Description Paragraph:
[0226] Referring now back to FIG. 14, as a programmer defines steps and sub-steps as tasks to be performed, he/she is setting up the main tasks and sub-tasks that the application will perform when executed. In this particular example, task 1 is a pre-qualification task for a loan as evidenced by the name Pre-Qual in window 291 in the Name column.

Detail Description Paragraph:
[0227] Task 1 comprises 3 sub-tasks, namely sub-task 1a, sub-task 1b, and sub-task 1c. Sub-task 1a comprises a module for obtaining data from a general credit field such as may be stored in a database and represented via metadata in the IOM described above. Hence, sub-task 1a would comprise the necessary modules or objects for interface with the IOM previously described above and for obtaining general credit data which may be an enterprise rating system code derived from actual credit reports. Additional related data may also be accessible in step 1a such as a list of creditors, payment history, and so on. Step 1b provides access to data about credit to the enterprise, and step 1c provides access to data about income such as total monthly income, source of income, etc. In this way, main task 1 may be completed by executing the sub-tasks 1a-1c.

Detail Description Paragraph:
[0229] Column 293 represents a time that each step and sub-step begins executing within the CINOS system. Numerals illustrated in column 293 represent units of time expired as the process is executed. For example, Main task 1 named Pre-Qual begins at 0000 (the time that the application is invoked). A client who is requesting a loan via telephone or other media may invoke IPM 287 thus beginning it's automated execution while the client waits in queue. In some embodiments, wherein a client is not live in queue, an agent may initiate the process based on a not-live request such as an e-mail or fax. In general the time displayed in windows under TIME Begin are returns only, based on the actual times related and previously required steps are completed. That is, typically a task will not begin at a fixed time from 0000, but will begin as soon as pre-requisite tasks are all completed.

Detail Description Paragraph:
[0230] Windows in column 295 show the time that a step actually ends. This is typically a return window as well, and the time displayed will be the begin time plus the task elapsed time to completion. The programmer typically allots a time for each task, and the actual time may be more or less than the allotted time. Other actions may be invoked in the case that the actual time exceeds the allotted time.

Detail Description Paragraph:
[0231] All sub-steps under a main task typically are allotted time increments (according to completion goal) of the allotted time for the main task such that the their sum equals the time allotted for the main task. The purpose for allotting time segments for each task and sub-task is so that efficiency improvements may be pursued with regards to client waiting and system performance and that interfaces with other systems such as routing systems or the like are handled smoothly. The time allotments, as described are in effect, time goals set by the enterprise. Time modules (not shown) are COM tools inserted by the programmer.

Detail Description Paragraph:
[0232] Windows in column 297 represents return fields that return actual elapsed times associated with each task and sub-task. For example, Main task 1 (Pre-Qual) began at time 0000. Allotted time for main task 1 is 0010. Main task 1 was actually completed at time 0008 or 0002 ahead of schedule. As is the case with column 295 (Time End), times in which the associated sub-tasks are completed are increments whose sum equals the actual time for the main task to obtain completion.

Detail Description Paragraph:
[0233] Windows under column 299 contains notification fields under the name-field Notify, which is part of title row 289. If there are no problems in the execution of a task or sub-task then notification is given to go on to the next task or sub-task. However, if there are problems in execution such as operation time out, or insufficient data for return, then a suitable notification-command may be given to the system such as return to agent, repeat prior task or sub-task, and so on.

Detail Description Paragraph:
[0234] It is important to note here that according to enterprise rules, notification may include stopping the process and requesting human intervention, allowing more allotted time for a task or sub-task to complete and then repeating the task or sub-task, or any variety of other options.

Detail Description Paragraph:
[0235] In this example, IPM 287 comprises 4 main tasks of which main task 1 has already been described. Main task 2 is determination of loan type. IPM 287 may comprise tasks or sub-tasks that may be executed in parallel under certain circumstances. Such is the case with part of main task 2 or more specifically sub-task 2a. For example, choices and data regarding loan type, amounts of loan, purpose for loan, and the like may be held in a separate section or database such as product database or the like. Therefore the multi-taskable IPM 287 may begin main task 2 upon invocation at time 0000. However, because a sub-task 2b requires the same data obtained with regards to main task 1, it cannot begin until main task 1 is complete or at 0008 as indicated in column 293.

Detail Description Paragraph:
[0236] A sub-task 2b1 is depended from sub-task 2b and is a data sorting operation. An example would be the sorting of assets from liabilities. Sub-task 2c allows insertion of data on a selected interactive or multimedia loan application in an automated fashion. Hence, the first 2 Main tasks and their associated sub-tasks pre-qualifies a client and obtains and inserts required data into an interactive application. For the purpose of this example, there have been no errors or problems with the first 2 main tasks allowing all notifications to proceed with the process without human intervention.

Detail Description Paragraph:
[0237] IPM 287 includes a main task 3 for post qualification and data validation. Such a task may be required according to enterprise rules with a system recommendation to be returned regarding weather or not a particular client should qualify. It should be noted here that a small amount of time elapses between a main task and a first sub-task with regards to main tasks 1-3 this is meant by the inventor to show system preparation time to execute to first sub-tasks.

Detail Description Paragraph:
[0238] Under main task 3, a sub-task 3a validates income. For example, a client's income data, instead of being current, may be out of date according to a time constraint imposed by the enterprise for updating income data in a database. If this is the case, then a suitable notification may be made to the system. The process may be temporarily halted due to the notification while an IVR interacts with the client to provide more current data. After the client has provided the

data, it is updated to the IOM and sub-task 3a may be repeated. In some embodiments, subsequent tasks or sub-tasks in a process may be executed while an IVR solicits more data from the client provided that they are not critically tied to the problem task or sub-task that could not be completed.

Detail Description Paragraph:
[0239] A sub-task 3b validates the applicant's source of income, perhaps by accessing a current database containing employment records provided by the client's employer. In one embodiment, an automated out-dialer may be used to contact the employer. When connection is made, the call may be transfer to an IVR or a live attendant so that validation may be completed. In some cases this will take more than the allotted time shown in this example because human intervention is utilized. In such cases where it is known or perceived that human intervention will be required, then more time will be allotted for the planned purpose. However, if the required data is supplied ahead of the loan application and stored for access by IPM 287, no human interface will be required.

Detail Description Paragraph:
[0240] Similarly, a sub-task 3c may prompt the client via IVR or live attendant for inclusion of any added income such as may not be indicated in data storage such as spousal income, an additional job-income source, and so on. Such IVR or live attendant interaction may be part of the loan procedure with appropriate time allotted to complete such procedures and not specifically the result of a problem or notification. Therefore, the amount of human intervention included in a business process such as represented by IM 287 may be dictated by enterprise rules.

Detail Description Paragraph:
[0241] A sub-task 3d calculates the debt to income ratio and other required calculations or manipulations of data and then makes a system recommendation, based on the calculation and enterprise rules, to the agent to which the client will be transferred for closing. Hence, the notify field for sub-task 3d is labeled present. Upon receiving the present notification, the system forwards the information (completed loan application) to an agent ahead of the client's call. An interface to the automated routing system enables IPM 287 to determine which agent will receive the client out of queue.

Detail Description Paragraph:
[0242] A main task 4 is simply to display, on an agent's graphical user interface (GUI) a completed copy of the loan application associated with the client's identification and incoming call. The notification field returns END at task 4 because it is the end of the procedure. At this time, a copy of IPM 287 with all of the fields complete may be sent to the programmer or system administrator as indicated on a top row comprising the label field (loan application), Time begin field (0000), Time End field (00305), Actual Time field (00255), and an update notification option labeled Update.

Detail Description Paragraph:
[0244] Each Interactive Process Module created is adapted to operate with a CISNOS operating system according to the present invention. As such, each completed module is callable by the OS when needed to perform its programmed function. Further, each module is provided with one or more inputs to be able to perform its function. In the example of qualifying a loan applicant as described above, the required inputs will be such as (a) potential borrower's identity, (b) type of loan desired, (c) amount of loan requested, and (d) payback period requested. Moreover, each module is adapted to interact with other CINOS modules. For example the loan qualification application described is adapted to access other modules, such as the IOM, using the potential borrower's ID as a key, to recall information, such as income information. Generally speaking, process modules will have, then, certain commonalties, such as at least one defining input, a task to be performed based on input, and a result to be returned, as well as a facility for returning the result.

Such results may in some cases be Yes/No, a recommendation or the like, and may be either displayed for a recipient or used as a further input to another Interactive Process Module.

Detail Description Paragraph:
[0245] It will be apparent to one with skill in the art that one IPM may be employed for one business process containing various secondary alterations to the generic process without departing from the spirit and scope of the preset invention. For example, a mortgage loan may have differing tasks and sub-tasks than an auto loan and so on. However, because access to system repositories and resources are similar in most loan processes regardless of type or amount of loan, modules may be inserted that cover the options. Moreover, separate business processes may be run from one IPM as long as the required modules are present and operational.

Detail Description Paragraph:
[0247] As previously described, IPM 287 is innovative in part because a generic application or model may be used for building several differing automated processes, and because it breaks down a process into tightly controlled tasks and sub-tasks that are executed in concert through interface with other CINOS systems. As a result, complicated business processes may be executed within CINOS much faster and more efficiently than with prior art systems. Furthermore, processes may in many instances be wholly automated and integrated with system routing and other intelligent services.

CLAIMS:

1. In an operating system (OS) for a multimedia communications center (MMCC), an interactive process module (IPM) for accomplishing a process, comprising: a plurality of code sets, each adapted to completion of a specific task in the overall process; an input interface for providing one or more inputs to the IPM; and an output function for returning a result; wherein the plurality of code sets are related by pre-requisite status, creating a required order of progression for the process, the process is initiated after being called by the OS and receiving required inputs, the IPM is adapted to interface with other OS modules for accessing and providing data, and upon completion of the last task the IPM returns the result.

2. The IPM of claim 1 wherein task structure and parameters are presentable in a graphical interface displaying tasks making up the IPM in prerequisite order.

5. The IPM of claim 2 wherein start and finish times are displayed for each task.

6. The IPM of claim 1 wherein, in performing any one task, next activity is variable, and is determined by performance to requirements programmed with the task.

7. The IPM of claim 6 wherein the task requirements include completion within a preprogrammed allotted time.

8. The IPM of claim 7 wherein next activity includes a choice of stopping the process and notifying a person in the event of non-completion of a task in an allotted time.

9. The IPM of claim 7 wherein one or more tasks require human intervention and activity, and comprising an activity of reminding a person responsible for an activity of a pending time deadline.

10. An operating system (OS) for a multimedia call center (MMCC) comprising one or more interactive process modules (IPMs) for accomplishing individual processes,

each IPM comprising: a plurality of code sets, each adapted to completion of a specific task in the overall process; an input interface for providing one or more inputs to the IPM; and an output function for returning a result; wherein the plurality of code sets are related by pre-requisite status, creating a required order of progression for the process, the process is initiated after being called by the OS and receiving required inputs, the IPM is adapted to interface with other OS modules for accessing and providing data, and upon completion of the last task the IPM returns the result.

11. The OS of claim 10 wherein task structure and parameters are presentable in a graphical interface displaying tasks making up the IPM in prerequisite order.

14. The OS of claim 11 wherein start and finish times are displayed for each task.

15. The OS of claim 10 wherein, in performing any one task, next activity is variable, and is determined by performance to requirements programmed with the task.

16. The OS of claim 15 wherein the task requirements include completion within a preprogrammed allotted time.

17. The OS of claim 16 wherein next activity includes a choice of stopping the process and notifying a person in the event of non-completion of a task in an allotted time.

18. The OS of claim 16 wherein one or more tasks require human intervention and activity, and comprising an activity of reminding a person responsible for an activity of a pending time deadline.

19. An object-oriented programming tool for use by a programmer in constructing an Interactive Process Module adapted for use with an operating system (OS) in a multimedia call center (MMCC), comprising: a graphical interface comprising an input facility adapted for defining a task, definition including a task identifier, a task description comprising activities performable by the operating system, and prerequisite relationship to any other tasks; a set of one or more inputs definable by the programmer; and one or more outputs; wherein entry of tasks with parameters by a programmer sequentially builds a process comprising multiple tasks to be performed in a requisite order dictated by the prerequisite relationship.

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